Annales Geophysicae 2001 vol.19 N5, pages 545-562

On the longitudinal structure of the transient day-to-day variation of the semidiurnal tide in the mid-latitude lower thermosphere - I. Winter season

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Abstract

The longitudinal structure of the day-to-day variations of semidiurnal tide amplitudes is analysed based on coordinated mesosphere/lower thermosphere wind measurements at several stations during three winter campaigns. Possible excitation sources of these variations are discussed. Special attention is given to a nonlinear interaction between the semidiurnal tide and the day-to-day mean wind variations. Data processing includes the S-transform analysis which takes into account transient behaviour of secondary waves. It is shown that strong tidal modulations appear during a stratospheric warming and may be caused by aperiodic mean wind variations during this event.

Keywords

Meteorology and atmospheric dynamics middle atmosphere dynamics, Waves and tides